Specific Learning Disorders

Natural History and Current Views

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■ *Each professional, whether pediatrician, neurologist, psychiatrist, psychologist or teacher, in evaluating behavioral, neuromuscular, and emotional factors with the tools of his discipline, can arrive independently at very similar views regarding etiology and diagnosis of learning and language disorders. Even though this is possible, it is essential to have the many disciplines work together. This manner of sharing information is not only supportive to the patient, but to the physician as well.*

The pediatrician's role does not stop, however, with the diagnosis, but continues with the working through of problems that the child and parents present to one another.

AS KNOWLEDGE accumulates about childhood learning and language disorders, it becomes increasingly difficult to keep in touch with recent thought and developments in this field. Part of the difficulty arises out of diversity of professional interest and the resulting scatter of information on the subject among journals of neurology, psychology, education and pediatrics. Oddly, the pediatric journals seem to print less on this subject than the others mentioned. Specific learning disorders are discussed in the literature from many different professional points of view, not only with regard to early recognition and management, but to basic research in cognitive processes.

Review and clarification of the professional relationships involved in the care of children with specific learning disorders should bring about a greater understanding of the scope and meaning of these conditions. Essential to appropriate care is a clear definition of the problems as well as knowledge of what happens to these children and their families once the diagnosis is made. The problems of children with specific learning disorders are often multiple and pervasive, expressed in disruptions of child development, social adaptation, function of family dynamics and demoralization of the child and parents.

Learning problems in general may be the result of emotional or neurological dysfunction, or a combination of both. This communication is concerned with "primary learning disorders"—also known as specific learning disorders, or dyslexia—in contrast to learning problems secondary to emotional disturbance or learning problems secondary to general mental retardation. It is essential for the pediatrician to be skilled in the differential diagnosis of these problems. The pediatrician should play an early prominent role in coordinating, assimilating, and translating the findings of the many

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disciplines to the family and child. After this is done a slow process of helping the family accept the findings begins. The interchange with other professionals active in the care of the child—social worker, neurologist, psychiatrist, psychologist, speech and language pathologist, education consultant and teacher—is intrinsic to the process of understanding these problems. School problems have come to involve the pediatrician in an area previously left to schools, psychiatrists or psychologists.

Learning Disorder

What is a specific learning disorder? It is an expression of neurological dysfunction, many times referred to as cerebral dysfunction. It may be acquired (as a result of neonatal or postnatal morbidity) or inherited. The latter, of genetic origin, more frequent in males, is termed primary or developmental dyslexia. Dyslexia is a disorder of reading. However, it is a term which has been widely used to mean a specific disorder of language, written or spoken, occurring in children with normal intelligence, involving one or more of the processes of visual or auditory perception, visual-motor ability, visual memory, visual sequencing, and auditory discrimination or memory.

Natural History

The child with a learning disorder comes to the pediatrician with a "hidden problem," often obscure to parents and teachers alike, but nevertheless very real for the child. Since the problems springing from them are obscure and subtle, learning disorders are often difficult to recognize and accept. It is around the child's and family's acceptance of a handicap that the physician must work. Not only does the pediatrician act as a skilled diagnostician, he acts as the counsellor and therapist for troubled children and their families. It is not enough to make a diagnosis, recite the literature and write letters to schools and referring physicians; it is important to follow the children with their families in an effort to help them work through their confusion and despair.

It is essential to identify the problems early. Once the problems are clearly defined, identified and brought out in the open, the patients and families are given an opportunity to express their feelings and act in a productive, rational manner.

Children with learning disorders present themselves to the physician in many different ways, that is, with somatic complaints of headache and gastrointestinal disturbance, or with evidence of psychological stress and family dysfunction. By the time these children and their parents reach the physician, elaborate systems of defense, such as denial, despair or projection, have been established in an attempt to deal with the problems at hand. The physician therefore must be aware of family dynamics and the "natural history" of learning disorders to effectively assist these children and their families.

Some of the questions the pediatrician might ask himself are: What does *this* handicapped child mean to *this* family? Is the family using the handicap for maintenance of homeostasis of family function?[1] What meaning does this handicap have for the family in relation to the school and community? In this regard it must be borne in mind that the status of the family is often viewed by the school and community through the child's performance at school.

In reference to the "natural history" of this problem, one can see the problems shift from the child or "identified patient"[16] to a whole spectrum of family-oriented problems, many times having to do with the parent's own feelings of self esteem. Families have been seen to use the child's problems in many different ways. One example of this can be through the use of many family survival myths[10]: "If it weren't for Billy, everything would be fine." This becomes a convenient way for families to direct attention from more serious painful family problems to the problems of the child.

It is interesting to see what happens to these children and their families. Many times the learning problem is unrecognized until the time the child enters school. Until entering school the child may have been considered "normal," having met many of the milestones of intellectual growth and social behavior. But, in going back in the history of many of these children, one often finds evidence of slow onset of expressive language, clumsiness, hypotonia, hypertonia, hyperactivity, irritability or impulsivity, to name a few of the symptoms that commonly appear.[14] It is only after the child enters school that difficulties arise out of his inability to meet the academic tasks at hand. Parents and teachers may describe him as inattentive, hyperactive, a dreamer, or unable to take instructions.[19] Parents begin to blame the child or the teachers by implication of motives—"If you'd only try harder" or "If you weren't so lazy," or "If

Billy only had a good teacher." If the use of blame proves ineffective, parents try to find a simple diagnosis: "Maybe his vision or his hearing should be tested." All the while he is trying to do what is expected of him during the school day and is experiencing repeated failure.

At times parents unwittingly give a child an inappropriate sense of power by saying "You're just doing this to hurt me," and the child soon learns that this is a way he can manipulate his parents. A covert power struggle results and may further exaggerate the problem. The physician therefore sees parents in all stages of confusion. After the parents go through phases of feeling despair, using blame, and arriving at a simple diagnosis, they go to a simple solution: "Everything will be fine when Billy learns to read." By this time, however, what was once a simple learning problem has become compounded by a feeling of worthlessness in the child, and a family desperately attempting to deal with its own disappointments.*

Each family has its own standards, rules and expectations, and it is interesting to see how differently one family views a learning problem than does another. If expectations are great within a family, the child fares less well than in a family where expectations are not so great. If risk-taking in the family is dangerous—that is, if there is little room for the child to make mistakes—he may soon stop trying and after awhile stop caring.

Parental concerns about causes are often brought out by the physician's question: "How do you see your child's problem?" However their questions are worded, parents seem to ask one of two things: "Is my child emotionally disturbed?" or "Is my child neurologically handicapped?" In the recent past children with primary learning disorders were thought to have learning problems secondary to emotional disturbance. Worst of all, parents often were made to feel blame and responsibility for their child's problems.

A learning disorder becomes a family problem, not just a problem of the child. Pediatricians are beginning to play a more active role in counselling and in pediatric mental health. There is a need for increased emphasis in pediatric training programs on problems of growth and development and mental health.[11]

*This train of events was originally described in a personal communication by Alan Leveton, M.D., University of California Medical Center, San Francisco.

Professional Roles

A question frequently asked by physicians is one having to do with understanding and interpretation of psychological test results and the role of the psychologist: "Since psychologists make the diagnosis, why is a pediatrician involved with this problem at all?" Also, "Is there any one psychological test or specific scatter [profile] of subtest items on the Wechsler Intelligence Scale for Children [WISC] that is or can be diagnostic of learning disorders?"

The psychologist's developmental assessment is of great assistance in making a proper evaluation, and provides valuable information about the child's intellectual function and social adaptation. There appears to be no single psychological test or subtest scatter on the WISC which by itself is diagnostic or pathognomonic of a specific learning disorder.[2,20] As in other areas of medicine, the child must be viewed as a whole. In this particular situation a great number of tests are used that evaluate the various processes of learning and the status of the neuromuscular system. (See list adjoining.)

The psychologist uses standardized tests to assess intellectual, social and psychological function as well as determine the status of the youngster's different processes of learning—that is the processes involved primarily in the visual and auditory pathways of learning. He observes many of the processes of cognitive behavior and in this way obtains an impression of cerebral function with or without associated learning disorders.

Some of the Psychological Tests Commonly Used in Evaluation of Intellectual and Social Maturity and Function of Children with Specific Learning Disorders.

Intelligence:

Wechsler Intelligence Scale for Children (WISC)—

Verbal Scale:

1. **Information**
2. **Comprehension**
3. **Arithmetic**
4. **Similarity**
5. **Vocabulary**
6. **Digit Span**

Performance Scale:

1. **Picture Completion**
2. **Picture Arrangement**
3. **Block Design**
4. **Object Assembly**
5. **Coding**

Test Behavior:

Rapport, Motor Activity, Attention, Response to Failure, Problem Solving Methods, Task Needs, Attitude, Verbal Activity, Distractibility, Performance Speed, Response Control.

Educational Achievement:
Wide Range Achievement Test (WRAT)—
Reading Grade Level: word recognition
Spelling Grade Level: writing dictated words
Arithmetic Grade Level: pencil and paper solution of number problems
Oral Reading Tests: Grey Gilmore
Visual Motor Coordination Test:
Bender Gestalt Visual Motor Test
Detroit, Benton: Memory for Designs Tests
Developmental Form Sequence
Frostig Test of Visual Motor Coordination:
Eye-Motor Coordination
Figure Ground Discrimination
Form Constancy
Position in Space
Spatial Relations
Draw-A-Person
Auditory Tests:
Sentence Memory (auditory tracking)
Detroit Tests of Learning Aptitude
Wepman Auditory Discrimination Test
Projective Tests
Thematic Apperception Test (TAT)
"If" Sentence Completion Test. . . .

Role of Neurologist

The relative importance of the neurological examination and certain neurological findings in respect to diagnosis of learning disorders is frequently misunderstood. Teachers and sometimes parents ask, "Has there been a neurological exam?" expecting a magic answer. Is there any one neurological finding that is diagnostic in itself of learning disorders? Such single findings as mixed dominance,[6] abnormal pattern of hair whorl, poor finger position sense,[3] or abnormal arm extension[17] or head rotation have at some time been thought to be present only in children with learning disorders, or have had some special diagnostic value ascribed to them.[15] Up to the present there appears to be no one specific finding that is in itself diagnostic.[9]

The neurologist arrives at the diagnosis of cerebral dysfunction with or without associated learning problems by viewing total function of the neuromuscular system.[7] This can be done by assessing the type and quality of motor activity.[13] He looks for dyspraxia, dyskinesia, synkinesia, confused laterality, confused body image,[5] poor finger sense,[3] or localization—to name a few signs of neurological dysfunction.[18]

It is possible to say what a learning disorder is as well as what it is not, and to define what one discipline does or does not do. To be sure, each professional, whether pediatrician, neurologist, psychiatrist, psychologist, speech and language pathologist, or teacher could arrive at the diagnosis of a learning disorder independent of the others through their shared knowledge and common understanding of the problem.

The pediatrician approaches the problem by obtaining a detailed clinical history of growth and development, which includes a pertinent assessment of neurological and cognitive function. Of great help is the important contribution of Katrina deHirsh in her book *Predicting Reading Failure in the Preschool Child.*[8] Her study of a group of preschool children who have been followed over a 20-year period shows a significant correlation between certain motor and cognitive skills and failure to read, or with a delayed onset of reading. The onset and quality of expressive language development, the child's use of words and ability to tell a story, his use of a pencil—that is, how it is held—and finally the child's ability to copy written symbols are of predictive diagnostic value.

Current Views of Remediation

Historically, in considering ways to remedy learning disorders clinicians' and research investigators' interests have shifted from *etiology,* to *process,* and finally to *analysis of the task.*[4] There was a time when interest was directed mainly to the process.[12] It was felt that once the child's difficulty with a process was defined the management of this "disability in process" could be specific to that disability. For example, for a weakness or disability in the process of visual memory, teaching methods were focussed directly on overcoming this particular disability. Educators "taught to a disability" or to a weakness. Others held that methods of instruction should utilize or teach to the "strengths," that is, to the available capacity of the child, not his weaknesses or deficiencies. In any event, it is helpful for the clinician to identify these specific areas of disability, to consider both the strengths and the weaknesses in the child's overall learning ability. This manner of looking at things becomes helpful in interpreting the findings and the diagnosis to the parents and the child.

Most recently, Bateman[1] and coworkers developed another approach as an outgrowth of their development of the Illinois Test of Psycholinguistics (ITPA). Their theory is that regardless of the process one must teach to the task, and the task is reading. Reading is learning in two stages. Stage one is the stage of symbol recognition and conversion of the symbol to a sound. Stage two has to do

with comprehension of this sound, or, in other words, reading with meaning. They feel that reading is essentially an auditory skill; that stage one is a rote task that should be taught with phonic and auditory methods. It is their belief that, regardless of the child's individual weakness, whether auditory or visual, he will learn with auditory methods of remediation. This is analogous to a hematologist's approach to a bleeding disorder: He determines exact clotting factor deficiencies, but many different kinds of deficiencies respond to treatment with plasma.

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OFFICE DETECTION OF HYPERLIPIDEMIA

"A single cholesterol test will pick up 85 to 90 percent of hyperlipidemia, if one uses 250 mg and above as a cutting off point and if one has a reliable laboratory. . . . There will be some people who have hypertriglyceridemia without hypercholesterolemia . . . , and you will miss them if all you do is a serum cholesterol. But you can get around that to a considerable degree by a simple additional step, and that is to collect fasting serum with a good overnight fast — 15 hours is preferable to 12 hours — and look at the serum to see if it's turbid. If it's turbid, even though the cholesterol may be under 250 mg, the triglycerides are elevated, and you'll pick up about half or two-thirds of those [patients] with hyperlipidemia that you have missed. . . . If you want to know if the turbidity is endogenously synthesized triglyceride (or very low low-density lipoprotein) as distinct from alimentary chylomicron, there's a very easy way to find out. Put the turbid serum in the refrigerator and let it stand overnight. If a cream layer rises to the top of the serum, that is almost certainly chylomicron of alimentary origin. Either the person did not tell you the truth when he said he had gone without food for 15 hours or he has a true chylomicronemia with an inability to clear plasma even after 15 hours of fasting. . . . By the simple look at turbidity, plus an icebox test, plus a cholesterol, you can make the diagnosis in 95 percent of cases."

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